DISEASE PREVENTION AND EPIDEMIOLOGY NEWSLETTER

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EpiNotes

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An Overview of Arboviral Disease in South Carolina

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Arthropod-borne viruses, or arboviruses, are transmitted to humans and animals by arthropods (primarily, but not limited to, mosquitoes and ticks). Surveillance data show that the range of arboviral diseases is expanding as are their vector-competent species of mosquitoes. After the introduction of Aedes albopictus (Asian Tiger mosquito) into the United States in the mid-1980s, the mosquito, which is able to transmit Yellow Fever, Dengue, and Chikungunya viruses, has expanded its range throughout the southeastern United States into the northeast and western parts of the nation.

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South Carolina Department of Health and Environmental Control

Mosquito control activities can decrease arboviral illnesses by reducing the vectors. The activities are most often performed by local county or city governments. *Continued p.2*

DHEC Onsite Hospital Ebola Response Assessments (ERA)

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DHEC is performing onsite Ebola Response Assessments (ERA) of the four hospitals that have volunteered to serve as Ebola assessment/treatment centers in S.C. The ERA Team consists of representatives from DHEC's Division of Acute Disease Epidemiology, Public Health Preparedness, Bureau of Laboratories, Emergency Medical Services, and Environmental Health, to provide the necessary expertise to assess the facilities in all the domains of preparedness included in the CDC Ebola Assessment Tool for the hospitals interested in undergoing an ERA Team visit. The Medical University of South Carolina was the first to undergo an assessment on August 4, 2015. Representatives from CDC and the Office of the Assistant Secretary for Preparedness and Response participated in this initial visit, along with DHEC staff, to provide guidance in conducting assessments. Future assessments will be performed by DHEC staff as the facilities express that they have readied themselves to proceed.

Control methods depend on the time of year, the mosquito species to be controlled, and the habitat. Control methods can include elimination of standing water, application of biological insecticides to kill mosquito larvae, or spraying insecticides from trucks or aircraft to kill adult mosquitoes. Individuals with arboviral infections are advised to restrict outdoor activities during the time they could be viremic to prevent mosquito vectors from acquiring arboviruses when taking a blood meal. Arboviral diseases are uncommon, but their presence in animals and mosquito vectors demonstrates that the risk of infection is present. The potential severity of infection highlights the importance of mosquito control programs and individual measures to protect against exposure to mosquitoes.

Human cases of arboviral diseases are uncommon in South Carolina, but their occurrence varies widely from year to year and does not necessarily correlate with the occurrence in birds, other animal hosts, or mosquito pools. Arboviral diseases may all present initially as an acute febrile illness with or without evidence of central nervous system infection, thus making all arboviral infections possible considerations in the differential diagnosis. Arboviral infections may be asymptomatic or cause severe illness with progression to acute hemorrhagic manifestations or long-term neurologic or arthritic sequelae. There are differences in the primary vector, the hosts, their distribution, and the clinical course. Surveillance data help determine the frequency and geographic distribution of human and animal arboviral diseases and their vectors. Suspect and confirmed cases of arboviral disease are reportable to the local county health department within 24 hours by phone. Reporting assists public health authorities in identifying clusters and implementing control measures to reduce future infections. This article provides an overview of selected arboviral diseases that occur in South Carolina.

West Nile Virus

West Nile virus (WNV) is the most common mosquito-borne arbovirus in the U.S. One of the most intense outbreaks of WNV in the United States occurred in 2012, with 2,873 cases and 286 deaths. Seasonal epidemics occur in North America from summer until the second or third frost causes mosquito die-offs. Birds are the primary host for WNV, and bird die-offs might indicate that West Nile virus is circulating between birds and mosquitoes in an area. Individuals who report dead birds to public health officials can play an important role in monitoring West Nile virus. The northern and southern house mosquitoes (Culex pipiens complex) are the primary mosquito vectors. Humans are most commonly infected by mosquitoes; infections from blood transfusions or organ transplantation rarely occur.

WNV activity varies widely in South Carolina from one season to the next. Three cases of WNV were reported in the state in 2014 with one death. Two cases of individuals with viremia, but no symptoms, were also detected through the screening of blood donors in 2014. To date in 2015, WNV has been detected in one bird, two mosquito pools, and two asymptomatic blood donors.

The incubation period is typically 2 to 6 days, but ranges from 2 to 14 days or longer in immunocompromised people. An estimated 70-80 percent of human WNV infections are subclinical or asymptomatic. Most symptomatic persons experience an acute systemic febrile illness that often includes headache, weakness, myalgia, or arthralgia; gastrointestinal symptoms and a transient maculopapular rash also are commonly reported. Most patients with non-neuroinvasive WNV disease or WNV meningitis recover completely, but fatigue, malaise, and weakness can linger for weeks or months. Patients who recover often have residual neurologic deficits. Less than 1 percent of infected persons develop neuroinvasive disease, which typically manifests as meningitis, encephalitis, or acute flaccid paralysis. Among patients with neuroinvasive disease, the overall case-fatality ratio is approximately 10 percent, but it is significantly higher for patients with WNV encephalitis.

Dengue and Chikungunya Virus

Dengue has become established in the continental United States. Chikungunya was first documented in the Western Hemisphere when cases were identified in the Caribbean in 2013. Local transmission of Chikungunya has since been identified in 45 countries and territories throughout the Americas. The temperate climate and use of air conditioning, which keeps mosquitoes out of many homes in most of the continental United States, makes sustained transmission of these viruses unlikely beyond South Florida and the US-Mexico border. South Carolina surveillance data show 19 travel-associated cases of Chikungunya in 2014, and five or fewer travel-associated cases of Chikungunya and Dengue have been reported in South Carolina to date in 2015. There has been no local transmission of either virus detected in South Carolina.

The primary mosquito vectors for Chikungunya and Dengue are *Aedes aegypti* and *Aedes albopictus*. People are the primary hosts of Chikungunya and Dengue viruses during epidemic periods. The majority (72 to 97 percent) of people infected with Chikungunya virus become symptomatic, whereas approximately half of Dengue-infected people are asymptomatic. Virus from infected individuals can be transmitted to mosquitoes up to 18 hours prior to onset of illness and for as long as fever is present, potentially contributing to the spread

of disease. Characteristic symptoms of Chikungunya include a sudden onset of fever and severe, debilitating pain in many joints for three to 10 days. Joint pains can be persistent for months to years. Characteristic symptoms of Dengue include nausea/vomiting, frontal headache, eye pain, muscle aches, joint pain, hemorrhagic manifestations, plasma leakage leading to respiratory distress, severe organ involvement, and central nervous system impairment. Dengue is more likely to cause neutropenia, thrombocytopenia, hemorrhage, shock, and death. Both diseases should be considered in the differential diagnosis of any individual who presents with an acute febrile illness who has returned from the Caribbean or any place where the diseases are endemic. Distinguishing the diagnosis is critical for case management. Suspect Chikungunya cases should be managed as Dengue, with avoidance of aspirin and non-steroidal anti-inflammatory drugs, until it can be ruled out due to the associated hemorrhagic manifestations and higher case fatality rate. Co-infection with these viruses is possible and has been reported in previous outbreaks.

Eastern Equine Encephalitis Virus

Eastern equine encephalitis (EEE) is a rare illness in humans, and only a few cases are reported in the United States each year, with most occurring in the Atlantic and Gulf Coast states. Most people infected with EEE have no apparent illness. EEE virus is one of the most severe mosquito-transmitted diseases in the United States, and approximately 50-90 percent of those who develop illness proceed to encephalitis with significant mental and physical damage in most survivors. Approximately 33 percent die. Birds are the reservoir hosts, and the black-tailed mosquito, *Culiseta melanura*, is the vector in freshwater swamps. Other mosquito species may be bridge vectors that carry the virus out of swamp areas into adjoining areas, and transmit the virus to humans, horses, and other animals. EEE is identified in horses most years in South Carolina, but only one human case of EEE has been reported in South Carolina since 2013.

Other Arboviruses Occurring in South Carolina

Outbreaks of other mosquito-borne illnesses periodically occur in the United States including La Crosse, St. Louis, and California Group encephalitis. Most cases of La Crosse disease occur in the upper Midwestern and mid-Atlantic and southeastern states. In North and South Carolina, it is most commonly detected in western mountainous areas. The disease is most common in children (especially boys) under the age of 16 years, and especially those under the age of 10 years. Many people infected with La Crosse virus have no apparent symptoms.

Prevention of Perinatal Hepatitis B Infection

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Hepatitis B virus (HBV) infection in pregnant women poses a serious risk to infants at birth. Approximately 40 percent of infants born to HBV-infected mothers go on to develop chronic infection if recommended post-exposure immunoprophylaxis is not administered beginning within 12 hours of birth. Perinatal Hepatitis B transmission can be prevented.

The CDC recommends that all pregnant women be tested routinely for hepatitis B surface antigen (HBsAg) during each pregnancy, during the first trimester, if possible. Testing should be done regardless of past testing results. Hepatitis B surface antigen positive results during pregnancy must be reported to DHEC within three days. Reporting allows prompt initiation of case management (see article below).

Visit **www.cdc.gov/hepatitis/hbv/perinatalxmtn.htm** for additional information.

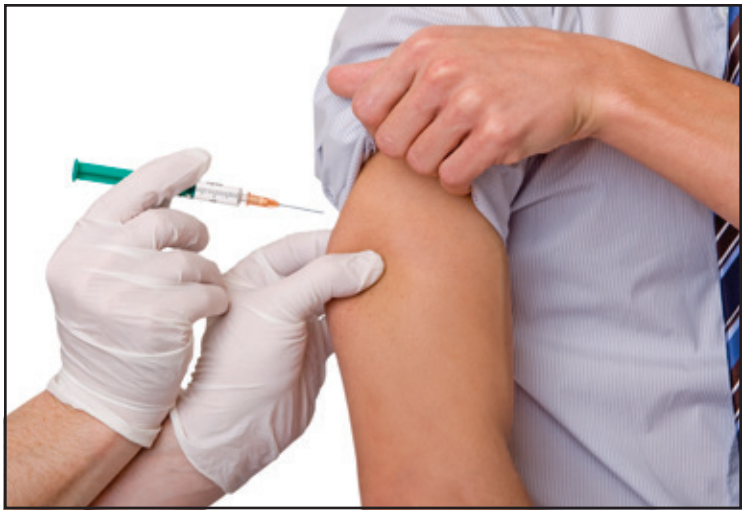
DHEC Perinatal Hepatitis B Case Management

The DHEC Perinatal Hepatitis B Prevention Program provides case management for infants born to HBsAg-positive mothers. DHEC case managers collaborate with prenatal care providers, delivery hospital staff, pediatric care providers, and families to assure that infants complete recommended post-exposure prophylaxis and post-vaccination serologic testing.

Recomended Management of Infants Born to HBsAg-positive Women:

- Administer single antigen Hepatitis B vaccine and Hepatitis B Immune Globulin (HBIG) (0.5 mL) within 12 hours of birth.
- Complete the vaccine series according to recommended schedule for infants born to HBsAg-positive mothers within 6 months of birth.
- Assure a referral to DHEC Perinatal Hepatitis B Case Management program.
- Conduct post-vaccination serologic testing for anti-HBs and HBsAg after completion of the vaccine series, at age 9-18 months.

Please contact Elona Rhame at **rhamele@dhec.sc.gov** for additional information on Perinatal Hepatitis B Virus transmission and case management.



Influenza Update for the 2015–2016 Season

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Peak influenza activity in the United States can occur anytime from November through May but the onset of sporadic activity is unpredictable. Getting the current flu vaccine as early as possible is recommended to provide protection throughout flu season. For specific recommendations for the 2015-2016 influenza vaccine, see the August 7, 2015, MMWR publication "Prevention and Control of Influenza with Vaccines: Recommendations of the Advisory Committee on Immunization Practices, United States, 2015-16 Influenza Season." Major points and updates are provided here.

CDC recommends all persons who are 6 months of age and older who do not have a contraindication to receiving the influenza vaccine. New this season is an updated algorithm for determining the appropriate number of doses for children 6 months through 8 years of age (www.cdc.gov/mmwr/pdf/wk/mm6430.pdf). Children in this age group who have previously received >2 total doses of trivalent or quadrivalent influenza vaccine before July 1, 2015, require only one dose for 2015-16. Additionally, there is no longer a preference for IIV (inactivated influenza vaccine) or LAIV (live attenuated influenza vaccine) for healthy children aged 2 through 8 years when either product is available.

Both trivalent and quadrivalent influenza vaccine formulations will be available again this year. Depending on the product, influenza vaccine can be administered by a variety of routes including intramuscular, intradermal, jet injector and nasal spray. The H3N2 virus strain that was most common last season was very different from the H3N2 strain that the vaccine was developed to protect against. This resulted in lower than usual vaccine effectiveness. Two of the vaccine strains included last season were updated for this season, the influenza A H3N2 train and the influenza B. Surveillance data to date suggests that most circulating viruses are well matched to the influenza strains included in this year's seasonal flu vaccine. The 2015-2016 influenza vaccine protects against:

- A/California/7/2009 (H1N1)-like virus,
- A/Switzerland/9715293/2013 (H3N2)-like virus, and
- B/Phuket/3073/2013-like (Yamagata lineage) virus.
- The quadrivalent vaccine will protect against these strains as well as B/Brisbane/60/2008-like (Victoria lineage) virus.

We encourage practitioners to inform your patients of the different vaccination options that can help to keep them healthy during the influenza season!

Please visit www.scdhec.gov/flu for additional information about flu guidance for clinicians and flu surveillance and activity in South Carolina.

9-Valent HPV Vaccine: Updated HPV Vaccination ACIP recommendations

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HPV is associated with cervical, vulvar and vaginal cancers in females, penile cancer in males and anal cancer and oropharyngeal cancer in both females and males. HPV infection also leads to cervical precancers and genital warts.

On December 10, 2014, the 9-valent HPV vaccine (9vHPV) was approved by the Food and Drug Administration for use in females aged 9 through 26 years and males aged 9 through 15 years. The vaccine targets HPV types 6, 11, 16 and 18 (similar to the quadrivalent HPV vaccine), as well as five additional types, HPV types 31, 33, 45, 52 and 58. In the United States the majority of all HPV-associated cancers are caused by HPV 16 or 18. According to CDC, the 5 additional types account for about 10–15 percent of cervical cancers. Similar to the other approved HPV vaccines, the 9vHPV is a 3-dose vaccine.

Currently, ACIP recommends 9-valent HPV vaccine as one of the three HPV vaccines that can be used for routine vaccination beginning at age 11 or 12 years

for both males and females. ACIP also recommends vaccination for females aged 13 through 26 years and males aged 13 through 21 years who have not been vaccinated previously. Vaccination is also recommended through age 26 years for men who have sex with men and for immunocompromised persons, including those with HIV infection, if not vaccinated previously.

For a clinician-specific resource sheet which provides additional guidance for use of 9-valent HPV vaccination, go to www.cdc.gov/hpv/downloads/9vHPV-guidance.pdf

Ref: Centers for Disease Control and Prevention. Use of 9-valent Human Papillomavirus (HPV) Vaccine: Updated HPV vaccine Recommendations of the Advisory Committee on Immunization Practices. MMWR 2015; 64(11):300-304.

2014 National Immunization Survey-Teen (NIS-Teen) Data Released

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2014 NIS-Teen vaccination coverage estimates were released on July 30, 2015. CDC conducts this survey via telephone interviews and provider questionnaires to assess vaccination coverage among US teens aged 13-17 years. Visit www.cdc.gov/mmwr/preview/mmwrhtml/mm6429a3.htm to read the full MMWR article about the 2014 NIS-Teen analysis.

South Carolina HPV data from the 2014 NIS-Teen Survey:

- There was a significant increase from 2013 to 2014 in ≥2 dose coverage for males from 12.1 percent to 22.5 percent.
- There were no significant changes for > 2 dose coverage for female with coverage estimates from 2013 to 2014 of 53.3 percent to 46.5 percent respectively.
- An estimated 35.9 percent of female SC teens and 16.1 percent of male SC teens have had ≥3 doses of HPV vaccine.

Coverage findings in the 2014 survey for other vaccines showed that South Carolina lagged behind as compared to the U.S. for Tdap, 72.6 percent to 87.6 percent, and for MenACWY, 67.3 percent to 79.3 percent, respectively. HPV coverage for South Carolina teens was higher as compared to the U.S. CDC encourages health care providers to strongly recommend adolescent vaccines to parents of 11 through 18-year-old patients and use every opportunity to vaccinate adolescent patients. Go to www.cdc.gov/vaccines/who/teens/for-hcp.html for more information on adolescent vaccines.

Coming Soon: SCIONx

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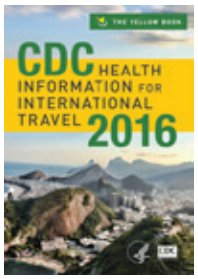
This fall, South Carolina's Electronic Disease Surveillance System (CHESS) will be replaced by a new system for reporting infectious disease called SCIONx. All current CHESS users will receive email instructions and training materials about how to switch to the new system in advance of the system going live. Providers who are not currently reporting via CHESS will be encouraged to start using SCIONx.

Send us an email at SCIONHELP@dhec.sc.gov if you would like to be on the mailing list to receive information about this new system.

The Yellow Book

Leon Bullard, MD
Division of Acute Disease Epidemiology
Medical Consultant



Early on in their training, all health care providers learn how to take a history and perform a physical examination. The lists of questions that are to be asked and methods of documentation of the answers are extensive; even with the utilization of electronic health records. An often overlooked component of the interview, unfortunately, is the travel history. Because of newly emerging infectious diseases (many of which are uncommon in our locale) or the re-emergence of old known diseases, being just a short flight away one must be aware of the recent travels of the person seeking care.

Primary care providers or health care staff in Urgent Care facilities or Emergency Departments may encounter persons with febrile illnesses, rash illnesses or symptom complexes atypical to "what is going around." A detailed travel history might point the provider to the correct diagnostic pathway.

Readers of the EpiNotes should be aware of the advice available from the Centers for Disease Control and Prevention: wwwnc.cdc.gov/travel.

Attention is directed to the online availability of The Yellow Book, 2016 Edition; this is also known as CDC Health Information for International Travel.

Also available for information concerning diseases associated with international travel is the World Health Organization (WHO) site: www.who.int/ith/en.

Specific questions pertaining to travel associated illnesses may be directed to DHEC's Division of Acute Disease Epidemiology at 803-898-0961.

South Carolina Muscular Dystrophy STARnet

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Bureau of Maternal and Child Health

Muscular dystrophies (MD) are a group of genetic diseases characterized by progressive muscle weakness and muscle cell death. There are nine major types of MD which vary by severity of muscle weakness, age of onset, rate of progression, affected genes and mode of inheritance. Types of MD include myotonic, congenital, Emery-Dreifuss, facioscapulohumeral, oculopharyngeal, limb-girdle, Duchenne and Becker. Duchenne and Becker MD are the most common, with Duchenne being the most severe condition.

In 2001, the federal government passed the Muscular Dystrophy Care Act to allow provisions for MD research. The Centers for Disease Control and Prevention created and funded the Muscular Dystrophy Surveillance, Tracking, and Research Network (MD STARnet) in response to the legislation. The primary goal of MD STARnet is to collect high-quality epidemiological data on the diagnosis, services, treatments, support, and care related to muscular dystrophies.

There are currently six sites participating: Colorado, Iowa, Utah, North Carolina, Western New York and South Carolina. South Carolina received funding to begin participation during the initiation of Phase III of the MD STARnet project. Here in the Palmetto State, we have a collaborative effort between DHEC, the Health and Demographics Section of the Office of Revenue and Fiscal Affairs (RFA) and the University of South Carolina School of Public Health. Our goals include:

1. to maintain a dynamic surveillance system for muscular dystrophy that capitalizes on the strengths of the medical record and administrative data available in South Carolina, and
2. to develop and manage a data system that allows us to conduct ongoing analyses of health care utilization, costs, and community participation of people with these conditions.

Beginning in late August, DHEC Nurses will start active data collection and continue the process throughout Phase III which will last until 2019. During this time, the South Carolina MD STARnet team will collect data from other sources, including vital records, and administrative and claims data from state-wide health clinics. South Carolina data will be pooled with data from the other sites to create a single, robust data set that will provide valuable information about MD in the US.

Contact John Clarkson, MPH at clarksjg@dhec.sc.gov for additional questions regarding STARnet.

Epi Notes, DHEC's epidemiology publication, is published in an online format.

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- To subscribe to the Epi Notes for email delivery, send an email to EpiNotes@dhec.sc.gov with "Subscribe" in the subject line.
- Epi Notes is also available from the DHEC website: www.scdhec.gov/Health/DiseasesandConditions/ChronicDiseaseData/EPINotes

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803-898-0558

If you are a health professional interested in receiving health notifications from the South Carolina Health Alert Network, please email SCHAN@dhec.sc.gov

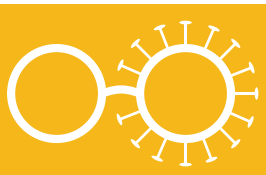
Disease Reporting

For immediate and urgently reportable conditions, call your regional health department:

- Lowcountry: 843-441-1091
- Midlands: 888-801-1046
- Pee Dee: 843-915-8845
- Upstate: 866-298-4442
- DHEC Bureau of Disease Control: 803-898-0861
  After-hours: 1-888-847-0902

Routine reports may be phoned in to your regional health department or faxed/mailed on a completed 2015 South Carolina Department of Health and Environmental Control Disease Reporting Form: www.scdhec.gov/library/D-1129.pdf

Contact information, including mailing addresses and fax numbers, are found on the List of Reportable Conditions: www.scdhec.gov/library/CR-009025.pdf



FLU WATCH

Flu season has arrived. Be sure to check DHEC's weekly Flu Watch for updates on influenza activity in South Carolina.

- Type "Flu Data" in the search box on DHEC's home page, or
- Bookmark DHEC's 2015-2016 Flu in South Carolina page in your browser: www.scdhec.gov/Health/DiseasesandConditions/InfectiousDiseases/Flu/FluData

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